IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	March 13, 2006
Michael Herscovici et al.		
Group Art Unit: 2166	:	Examiner: Khanh B. Pham
Serial No.: 10/605,208	:	Filed: 9/15/2003
Attorney Docket: ARC920030035US1	:	Confirmation No.: 2207

Title: AUTOMATIC QUERY ROUTING AND RANK CONFIGURATION FOR SEARCH QUERIES IN AN INFORMATION RETRIEVAL SYSTEM

DECLARATION PER 37 CFR 1.131 AND 37 CFR 1.68

Director of the USPTO
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313

Sir:

As attorney of record for the above-identified patent application, I hereby declare as follows:

1. On November 11, 2002, a disclosure describing the invention was submitted using IBM's computerized time-stamped invention disclosure database system for evaluation by IBM's IP Law staff. Technical reviewers were assigned to assess the invention.
2. On February 20, 2003, a review meeting was held per IBM's invention review policy to discuss the invention's technical and business merit. On March 3, 2003, a decision was made to conduct a prior art search for the invention. Descriptive search claims were written and the invention disclosure was sent out for search on April 8, 2003. The search results were received on May 2, 2003. The search results were then reviewed, and a decision to file a patent application was made on May 19, 2003; the invention was then transferred to outside counsel for patent application preparation. From prior to November 11, 2002, until the filing of the patent application on

September 15, 2003, I exercised due diligence toward constructively reducing the invention to practice, as evidenced by the disclosure material attached hereto as Exhibit A. The disclosure was evaluated and processed as part of IBM's standard patent processing procedures and culminated in the filing of the patent application on September 15, 2003.

3. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

By Marc D. McSwain

Marc D. McSwain (#44,929)
Agent for Applicants
Phone (408) 927-3364

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Group Art Unit: 2166
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Title: AUTOMATIC QUERY ROUTING AND RANK CONFIGURATION FOR SEARCH QUERIES IN AN INFORMATION RETRIEVAL SYSTEM

DECLARATION PER 37 CFR 1.131 AND 37 CFR 1.68

Sir:

As an inventor named below, I hereby declare as follows:

1. I am an original, first and joint inventor of the invention described and claimed in claims 1-17 in the above-identified patent application filed on September 15, 2003, which I have assigned to the IBM Corporation. The subject matter and the claimed invention in this patent application were, at the time the invention was made, owned by the IBM Corporation or subject to an obligation of assignment to the IBM Corporation.

2. Prior to November 11, 2002, I conceived the invention as described and claimed in the subject application in the United States as evidenced by the disclosure material attached hereto as Exhibit A. The disclosure describing the invention was submitted on November 11, 2002, using IBM's time-stamped invention disclosure database system for evaluation by IBM's IP Law staff.

3. From prior to November 11, 2002, until the filing of the patent application on September 15, 2003, I exercised due diligence toward reducing the invention to practice, as evidenced by the disclosure material attached hereto as Exhibit A. The disclosure was evaluated and processed as part of IBM's standard patent processing procedures and culminated in the filing of the patent

application on September 15, 2003.

4. The photocopies of the disclosure materials attached to this declaration as Exhibit A are true copies of the original pages showing conception of the invention prior to November 11, 2002 coupled with due diligence from prior to November 11, 2002 to the filing of the patent application.

5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

Inventor Signature: _____ Date: March 30, 2006
Michael Heracovici

Inventor Signature: _____ Date: _____
Reiner Kraft

Inventor Signature: _____ Date: _____
Jason Zien

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Group Art Unit: 2166
Michael Herscovici et al.	:	Examiner: Khanh B. Pham
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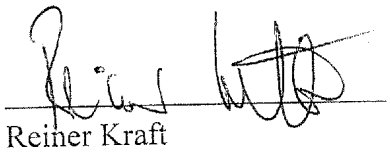
Respectfully submitted,

Inventor Signature: _____ Date: _____
Michael Herscovici

Inventor Signature:  Date: 3/21/2006
Reiner Kraft

Inventor Signature: _____ Date: _____
Jason Zien

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Group Art Unit: 2166
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Respectfully submitted,

Inventor Signature: _____ Date: _____
Michael Herscovici

Inventor Signature: _____ Date: _____
Reiner Kraft

Inventor Signature: _____ Date: 4/1/06
Jason Zien

EXHIBIT A

Disclosure ARC8-2002-0125

Prepared for and/or by an IBM Attorney - IBM Confidential

Created By Reiner Kraft On 09/13/2002 05:27:03 PM PDT
Last Modified By Enterprise Agentmgr On 08/21/2004 10:06:51 PM EDT
Archived on 08/21/2004

Required fields are marked with the asterisk (*) and must be filled in to complete the form .

*Title of disclosure (in English)
Automatic query routing and rank configuration for search queries in a Web information retrieval system (AutoRank)

Summary

Status	Final Decision (File)
Final deadline	
Final deadline reason	
Docket family	ARC9-2003-0035
* Processing location	Almaden
* Functional area	(8CC) 8CC - Exploratory DB - (W.Cody)
Attorney/Patent professional	Marc D McSwain/Almaden/IBM
Invention development team (IDT)	Marc D McSwain/Almaden/IBM Bill Cody/Almaden/IBM Eugene Shekita/Almaden/IBM Shivakumar Vaithyanathan/Almaden/IBM Iris Eiron/Almaden/IBM Daniel M Shiffman/Almaden/IBM
Submitted date	11/11/2002 05:47:01 PM MST
* Owning division	RES
Incentive program	
Lab	
* Technology code	605
Patent value tool (PVT) score	

Inventors with a Blue Pages entry

Inventors: Reiner Kraft/Almaden/IBM, Jason Zien/Almaden/IBM

Inventor Name	Inventor Serial	Div/Dept	Inventor Phone	Manager Name
> Kraft, Reiner	843388	22/8CCD	457-1975	Shekita, Eugene
Zien, Jason Y.	786879	22/8CCD	457-2984	Shekita, Eugene

> denotes primary contact

Inventors without a Blue Pages entry

Invention Development Team Information

Attorney/Patent professional	Marc D McSwain/Almaden/IBM
Invention development team (IDT)	Marc D McSwain/Almaden/IBM Bill Cody/Almaden/IBM Eugene Shekita/Almaden/IBM Shivakumar Vaithyanathan/Almaden/IBM Iris Eiron/Almaden/IBM

Daniel M Shiffman/Almaden/IBM
Response due to IP&L 02/17/2003

Main Idea

To view the Main Idea of this disclosure, open the "Main Idea" document from the view
*Critical Questions (Questions 1-9 must be answered in English)

*Question 1
On what date was the invention workable? 06/01/2002 Please format the date as MM/DD/YYYY
(Workable means i.e. when you know that your design will solve the problem)

*Question 2
Is there any planned or actual publication or disclosure of your invention to anyone outside IBM? ○ Yes ● No

If yes, Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:

Are you aware of any publications, products or patents that relate to this invention? ○ Yes ● No

If yes, Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:

*Question 3
Has the subject matter of the invention or a product incorporating the invention been sold, used internally in manufacturing, announced for sale, or included in a proposal? ○ Yes ● No

Is a sale, use in manufacturing, product announcement, or proposal planned? ○ Yes ● No

If Yes, identify the product if known and indicate the date or planned date of sale, announcements, or proposal and to whom the sale, announcement or proposal has been or will be made.
Product:
Version/Release:
Code Name:
Date:
To Whom:
If more than one, use cut and paste and append as necessary in the field provided.

*Question 4
Was the subject matter of your invention or a product incorporating your invention used in public, e.g., outside IBM or in the presence of non-IBMers? ○ Yes ● No

If yes, give a date. Please format the date as MM/DD/YYYY

*Question 5
Have you ever discussed your invention with others not employed at IBM? ○ Yes ● No

If yes, identify individuals and date discussed. Fill in the text area with the following information, the names of the individuals, the employer, date discussed, under CDA, and CDA #.

*Question 6
Was the invention, in any way, started or developed under a government

contract or project? ○ Yes ● No ○ Not sure

If Yes, enter the contract number

*Question 7
Was the invention made in the course of any alliance, joint development or other contract activities? ○ Yes ● No ○ Not Sure
If Yes, enter the following:

Name of Alliance, Contractor or Joint Developer

Contract ID number

Relationship contact name

Relationship contact E-mail

Relationship contact phone

*Question 8
Have you, or any of the other inventors, submitted this same invention disclosure or similar invention disclosure previously? ○ Yes ● No
If Yes, please provide disclosure number below:

*Question 9
Are you, or any of the other inventors, aware of any related inventions disclosures submitted by anyone in IBM previously? ○ Yes ● No
If Yes, please provide the docket or disclosure number or any other identifying information below:

Question 10
What type of companies do you expect to compete with inventions of this type? *Check all that apply.*

- ☐ Manufacturers of enterprise servers
- ☐ Manufacturers of entry servers
- ☐ Manufacturers of workstations
- ☐ Manufacturers of PC's
- ☐ Non-computer manufacturers
- ☐ Developers of operating systems
- ☐ Developers of networking software
- ☐ Developers of application software
- ☐ Integrated solution providers
- ☐ Service providers
- ☐ Other (Please specify below)

Internet search engines

Question 11
If the invention relates to a product or service that is outside the scope of your business unit, please recommend IBM business unit(s), IBM location(s) or individual(s) within IBM that you think would provide a good evaluation of your invention:

*Patent Value Tool (Optional - this may be used by the inventor and attorney to assist with the evaluatior

Evaluation

This team evaluation was entered by Khanh Tran/Almaden/IBM on 03/03/2003

What is the team's evaluation of this disclosure? Search

Date evaluated : 03/03/2003

Evaluation comments

At the meeting on 2/20/03 with Anant Jinghran, Bill Cody, Khanh Tran and Reiner Kraft, it was decided that the invention be searched.

Final Evaluation History	Who made the final evaluation	Final evaluation date
Search	Khanh Tran/Almaden/IBM	3/3/2003

Search Information

Date sent: 04/08/2003 *Target completion date: 05/15/2003 Search results received date: 06/17/2003

Who was the search sent to (This area is to designate a Local Searcher name or WAIPL): WAIPL

*Search type: ☒ Patentability ☐ Clearance ☐ Validity ☐ State of Art

*Features to be searched:

1. A method for identifying documents most relevant to a query from a collection of documents that are organized based on a set of indices, the method comprising:

a) determining a query class for the query, the query class associated with a routing function and a ranking function, the routing function capable of determining subsets of the collection that most likely include the most relevant documents, the ranking function capable of sorting the documents in terms of relevancy;

b) determining the indices that are most relavant to the query;

c) identifying a set of documents related to the query based on the determined indices by passing a ranking function associated with the determined query class along with the query to each search engine that manages a determined index from a collection of relevant indices; and

d) collecting ranked results, merging and sorting these by relevancy, and returning a subset of the highest ranked documents as the documents most relevant to the query.

2. The method as in (1) wherein the step (a) for determining a query class includes the following steps:

a) Analzing user profile data, user search context and history data, query log files, and index statistics, as well as other query related external data that seems to be relevant or helpful to determine a query class for said search query;

b) As a result of the query analyzis a query class for said query is obtained and associated to the search query.

3. The method as in (1) wherein the step (b) for determining the indices that are most related to the query includes the following step:

a) Usage of the routing information obtained from applying the routing function of the query class that is associated to the said search query to determine the set of indices to use and consult during the retrieval process.

4. The method as in (1) wherein the step (c) for identifying a set of documents related to the query based on the determined indices includes the following steps:

a) Use ranking function that is associated to the determined query class (see 1 a).

a) Forward search query and ranking function (a) to the search engine(s) that manage the selected indicies (from 1 b) .

5. The method in (1) wherein the step (d) for collecting ranked results, sorting and merging these, and returning a subset of the highest ranked documents as the documents most relevant to the query includes the following steps:

a) Each search result item has a (normalized) score

b) Collect all results from 1c).

c) Sort search results by score in decreasing order (assume high score is better)

d) return top k results from sorted list of search results from the merged search result list to the user.

Search Office Information

Target completion date: 05/15/2003 ☐ Search has been delayed Ship/Return date: 05/02/2003

Search conducted by Vitello

Comments

Final Decision

This decision was entered by Ramani Peiris/Almaden/IBM on 05/19/2003

Decision: File Status: N/A

PPM area: 700 - Network Computing

Date of final decision : 05/19/2003

Additional filing information
Planned Filing date:
Filing comments:

Additional decision comments

Final Decision History

Entered on 19-May-2003 by Ramani Peiris
File N/A 19-May-2003 Docket Family: ARC920030035

Post Disclosure Text & Drawings

Form Revised (05/28/03)

Disclosure ARC8-2002-0125

Prepared for and/or by an IBM Attorney - IBM Confidential

Created By Reiner Kraft On 09/13/2002 05:27:03 PM PDT
Last Modified By Reiner Kraft On 11/12/2002 07:03:08 PM EST

Required fields are marked with the asterisk (*) and must be filled in to complete the form .

***Title of disclosure (in English)**

Automatic query routing and rank configuration for search queries in a Web information retrieval system (AutoRank)

Summary

Status		Under Evaluation
Final Deadline		
Final Deadline Reason		
*Processing Location		Almaden
*Functional Area	select	(8CC) 8CC - Exploratory DB - (W.Cody)
Attorney/Patent Professional		Alison Mortinger/Almaden/IBM
IDT Team	select	Alison Mortinger/Almaden/IBM
Submitted Date		11/11/2002 05:47:01 PM MST
*Owning Division	select	RES
Incentive Program		
Lab		
*Technology Code		605
PVT Score		

Inventors with a Blue Pages entry

Inventors: Reiner Kraft/Almaden/IBM, Jason Zien/Almaden/IBM

Inventor Name	Inventor Serial	Div/Dept	Inventor Phone	Manager Name
> Kraft, Reiner	843388	22/8CCD	457-1975	Shekita, Eugene
Zien, Jason Y.	786879	22/8CCD	457-2984	Shekita, Eugene

> denotes primary contact

Inventors without a Blue Pages entry

IDT Selection

Attorney/Patent Professional	Alison Mortinger/Almaden/IBM
IDT Team	Alison Mortinger/Almaden/IBM
Response Due to IP&L	12/12/2002

Gene B Shekita

***Main Idea**
1. Describe your invention, stating the problem solved (if appropriate), and indicating the advantages of using the invention.

Problem Description

Within the current Internet search technology ranking model there exist one or more ranking functions that each take a vector of parameters as an input to manipulate the overall scoring of a document given a query. People often hand-tune such a ranking function using a small sample of test queries. Once a "good" set of ranking parameters is found, this set will be used to rank all queries.

Experiments show that for certain queries different ranking parameters produce better results. This can be verified if the expected result or truth set for a given query is known. However, one set of ranking parameters for query A may produce bad results for query B.

Furthermore, with search engines that have multiple (possibly overlapping) indices it makes also a difference in the search quality depending on where (which index) the query is routed. For instance, a search engine keeps a text index of all documents and a separate anchor-text index obtained by link analysis from these documents. Sending query A to the text index may produce the desired result, while sending query B to the text index may not produce good results at all.

We want to have an **automatic approach of deciding what set of ranking parameters should be used for a given query**. Furthermore, **we want to decide dynamically to which set of indices to send a particular query**. To summarize we want to have query dependent reliable heuristics to determine the best routing and ranking parameters to optimize the precision of the retrieval process.

Proposed Solution

We devised a strategy that first analyses the query string, The number of query terms is the first impression we use to determine the type of query.

Then we need to classify queries into query types. It has proven to do well in experiments if we classify queries into either (but we're not limited to these categories):

A) Informational type queries (e.g., looking for a particular driver for a computer model)
B) Homepage finding (e.g., find homepage for IBM alphaworks)

We consider index term statistics and use a simple probability model that is applied to the query terms. From this information we then determine whether the query is of type A or more likely to be of type B). Furthermore, we can inspect query log files to look for further query term statistics.

For each category A and B we have a set of ranking parameters for which we know that they produce good results. Also, for each query type category we know what index to consult or what weights need to be associated with results from different indices.

To summarize, the invention comprises the following steps:

1) Receive query q
2) Parse q and generate set of query terms
3) Count number of query terms
4) Look-up statistical information of these query terms and combinations of these query terms (permutations) from the index term statistics

e.g., query term "a" appears on x different documents in the index
e.g., query term "a" appears on x different documents in the index and query term "b" appears on "y" different documents
what is probability that both appear on the same document? (P(ab))
5) Look-up lexical affinities of permutations of these query terms and their actual occurrence in the index
e.g., P(ab) is only approximation. Better if we have a precise count in form of lexical affinity statistics
6) Perform other form of statistical analysis, analyze log data, user feedback etc.
7) Use the results from 3-6 to classify query into query category
8) Look-up set of ranking parameters for that query category
9) Look-up routing information (index selection) for that query category
10) Issue query to search engine by applying ranking parameters from 8) and routing information from 9)
11) Display search results

In a different embodiment a classifier can be trained off-line with a training set for higher accuracy. Also, we can apply online-learning algorithms or boosting algorithms to further extend the functionality. For instance, instead of having only two categories, we can have n categories. In the extreme case let n be the number of queries, then each query has its own set of ranking parameters and routing information.

Example 1:

query="linux"

A one term query. The index statistics show that the index term occurs on 70,000 documents (in an index of 3,000,000 docs). Furthermore, the log file provides evidence that the term is often used. AutoRank therefore infers that this query is of type B and routes the query to the anchor text index first. Furthermore, it changes the rank parameters to boost static rank factors (e.g., Pagerank).

Example 2:

query="ibm search"

A two term query. The index statistics show that the index term "ibm" occurs on 2,000,000 documents (in an index of 3,000,000 docs). The index term "search" occurs on 250,000 documents (in an index of 3,000,000 docs). The probability that both occur on the same document therefore is P(ibm * search) = dococcurences(ibm) * dococcurences(search)/3,000,000 = 166,666

Furthermore, the log file provides evidence that both term are often used. There are even 400,000 documents that contain the lexical affinity ("ibm search"), which is higher than the approximation based on the probability (P a*b).
AutoRank therefore infers that this query is of type B and routes the query to the anchor text index first. Furthermore, it changes the rank parameters to boost static rank factors (e.g., Pagerank).

Example 3:

query="setup and configure wireless adapter"
Very specific search request, and the index term statistics show that there are only few pages that contain that information. AutoRank therefore classifies as a query type A (informational type). AutoRank routes the query to the text index and igonores the anchor text index completely. It de-emphasized static ranks and focuses on classical information retrieval methodologies.

Broadest Claim

A method of query specific ranking and query routing comprising step 1 to 11

If this is too broad we can narrow slightly down.

2. How does the invention solve the problem or achieve an advantage,(a description of "the invention", including figures inline as appropriate)?
The invention increases the precision of Internet search engines and therefore and therefore enhanced the overall search experience.

3. If the same advantage or problem has been identified by others (inside/outside IBM), how have those others solved it and does your solution differ and why is it better?
We are not aware of other solutions with the described functionality.

4. If the invention is implemented in a product or prototype, include technical details, purpose, disclosure details to others and the date of that implementation.
We have implemented a prototype in the TREVI search system that can be accessed at http://trevi.almaden.ibm.com.
Based on experiments with a benchmark set of 180 queries we can show that the average precision using AutoRank is higher than without using it. Indeed, in the homepage finding task TREVI is better by a factor of more than 2 as the current W3 Inktomi based solution. Because of higher precision users experience a better overall search experience. We expect further improvements downstream when integrating more heuristics in AutoRank combined with online-learning algorithms.

***Critical Questions (Questions 1-9 must be answered in English)**

***Question 1**
On what date was the invention workable? 06/01/2002 **Please format the date as MM/DD/YYYY**
(Workable means i.e. when you know that your design will solve the problem)

***Question 2**
Is there any planned or actual publication or disclosure of your invention to anyone outside IBM? ○ Yes ● No

If yes, Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:

Are you aware of any publications, products or patents that relate to this invention? ○ Yes ● No

If yes, Enter the name of each publication or patent and the date published below.
Publication/Patent:
Date Published or Issued:

***Question 3**
Has the subject matter of the invention or a product incorporating the invention been sold, used internally in manufacturing, announced for sale, or included in a proposal? ○ Yes ● No

Is a sale, use in manufacturing, product announcement, or proposal planned?

○ Yes
● No

If Yes, identify the product if known and indicate the date or planned date of sale, announcements, or proposal and to whom the sale, announcement or proposal has been or will be made.

Product:
Version/Release:
Code Name:
Date:
To Whom:

If more than one, use cut and paste and append as necessary in the field provided.

***Question 4**

Was the subject matter of your invention or a product incorporating your invention used in public, e.g., outside IBM or in the presence of non-IBMers?

○ Yes
● No

If yes, give a date. **Please format the date as MM/DD/YYYY**

***Question 5**

Have you ever discussed your invention with others not employed at IBM?

○ Yes
● No

If yes, identify individuals and date discussed. Fill in the text area with the following information, the names of the individuals, the employer, date discussed, under CDA, and CDA #.

***Question 6**

Was the invention, in any way, started or developed under a government contrac or project?

○ Yes
● No
○ Not sure

If Yes, enter the contract number

***Question 7**

Was the invention made in the course of any alliance, joint development or other contract activities?

○ Yes
● No
○ Not Sure

If **Yes**, enter the following:

Name of Alliance, Contractor or Joint Developer

Contract ID number

Relationship contact name

Relationship contact E-mail

Relationship contact phone

***Question 8**

Have you, or any of the other inventors, submitted this same invention disclosure or similar invention disclosure previously?

○ Yes
● No

If Yes, please provide disclosure number below:

***Question 9**

Are you, or any of the other inventors, aware of any related inventions disclosures submitted by anyone in IBM previously?

○ Yes
● No

If Yes, please provide the docket or disclosure number or any other identifying information below:

Question 10

What type of companies do you expect to compete with inventions of this type? *Check all that apply.*

- ☐ Manufacturers of enterprise servers
- ☐ Manufacturers of entry servers
- ☐ Manufacturers of workstations
- ☐ Manufacturers of PC's
- ☐ Non-computer manufacturers
- ☐ Developers of operating systems
- ☐ Developers of networking software
- ☐ Developers of application software
- ☐ Integrated solution providers
- ☐ Service providers
- ☐ Other (Please specify below)

Internet search engines

Question 11

If the invention relates to a product or service that is outside the scope of your business unit, please recommend IBM business unit(s), IBM location(s) or individual(s) within IBM that you think would provide a good evaluation of your invention:

***Patent Value Tool (Optional - this may be used by the inventor and attorney to assist with the evalu**

(The Patent Value tool can be used by the inventor(s) to determine the potential licensing value of your invention.)

Market

***Question 1:** What is the anticipated annual market size (in dollars) that will be captured by your invention?

Reason(s) for above Answer:

Claims

***Question 1:** How new is the technical field?

Reason(s) for above Answer:

***Question 2:** How central is the invention to the product(s) which might be expected to contain the invention?

Reason(s) for above Answer:

***Question 3:** What is the scope of the claim?

Reason(s) for above Answer:

Portfolio Need
***Question 1:** What are the portfolio needs in the area of your invention?

Reason(s) for above Answer:

Exploitation & Enforcement
***Question 1:** How easily can the use of the invention by a competitor be detected?

Reason(s) for above Answer:

***Question 2:** How easily can the use of the invention be avoided by a competitor?

Reason(s) for above Answer:

Business Value
***Question 1:** What percentage of the companies producing products in the field of this invention might use this invention?

Reason(s) for above Answer:

***Question 2:** What is the value of this patent to current or anticipated Alliance Activity between IBM and other companies?

Reason(s) for above Answer:

***Question 3:** What is the value of this patent to current or anticipated Technology Transfer Activity between IBM and other companies?

Reason(s) for above Answer:

***Question 4:** Does it result in prestige to IBM?

Reason(s) for above Answer:

Post Disclosure Text & Drawings
To add additional information related to this disclosure once it has been submitted, click the action button below and a new document will be opened for you to enter the new information. To view existing post disclosure information, double-click on the item in the list below (if there has been additional information entered), and the document will open for you to view.

Date entered	**Post disclosure information (comments and drawings)**

Form Revised 09/01/02)